Children and HIV Infection in Relation to the Human Rights Council 22nd Session

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US has demonstrated commitment for the past decade through PEPFAR and Global Fund contributions, and expressed ongoing and future commitment through the "PEPFAR Blueprint; Creating An AIDS-Free Generation". This is a plan to virtually eliminate HIV transmission to infants and to provide effective, science-based treatment and prevention interventions for all who are infected, so that the impact of AIDS is mitigated.

This includes support for and high-level engagement with the United Nations four-prong approach to achieve the elimination of perinatal HIV transmission, being undertaken through the Global Plan for the Elimination of Maternal-Infant HIV Transmission. The four prongs are (1) prevention of HIV infection among reproductive-age women, (2) Counseling and support to HIV-infected women, (3) testing for HIV and provision of anti-retroviral drugs to pregnant women, and (4) HIV counseling, treatment, and support for women and children with HIV.

Treating children with HIV is an important and under-utilized endeavor. There is exciting news this week from the Retrovirus Conference in Atlanta, USA about the cure of an infant given early and aggressive medications. Across the planet, it is clear that antiretroviral drugs are highly effective in prolonging life among children.

However, the percentage of children appropriately treated for HIV in the highest-burden countries is less than half that of adult HIV treatment. Only half the drugs available to adults are available to small children. Market-based approaches to increasing the production and brining to licensure of new pediatric anti-retroviral medications are being undertaken by UNITAID, with participation of major purchasing partners; including PEPFAR and Global Fund. However, the technical and commercial challenges to new pediatric drug formulation remain formidable, and efforts in this regard must continue.

Turning to prevention of HIV in children, the elimination of maternal-infant HIV is an achievable goal based on an understanding of the biology of transmission, and possibly with currently-available tools. To understand how to approach this goal, we need to understand the modes and timing of HIV transmission to infants. Transmission of HIV to an infant can occur during the in utero period (approx. 10%-20% of transmissions), during the birth process (approx. 40-45%) and during breastfeeding (approx. 40-45%). Anti-retroviral drug therapy can interrupt transmission to the infant during any of these stages.

Ground-breaking research showing that AZT, the first licensed anti-retroviral drug, is effective in interrupting mother-to-child HIV transmission was reported in February, 1994. By the end of that calendar year, there were guidelines and aggressive implementation

across the US. This regimen was not implemented in low/middle-income countries due to perceived complexity of the regimen and cost.

Further research showed the effectiveness of the second proven drug for this purpose, and one that can be given as a single dose; nevirapine. However, as this intervention was used and studied, it became apparent that viral resistance can emerged following this use of this drug alone. Most recently, the effectiveness of combination drug therapy to interrupt transmission, both during pregnancy, during birth, and during breast-feeding, has become clear.

These scientific advances are being adopted by countries across the globe, and create possibility for elimination of maternal-infant HIV. There is a history of trying to eliminate maternal to infant HIV transmission. A little-remembered fact is that PEPFAR began as a PMTCT program. It appeared possible back in 2003. Yet, operational obstacles exist, progress has been slow, and efforts have recently been re-doubled. UNAIDS, PEPFAR, UNICEF, and other key global partners have set the elimination of maternal-infant transmission as a global goal.

Based on this commitment, there has been the mobilization of hundreds of millions of dollars for scaled-up PMTCT. There has been progress. Between 2003 and 2010, there are an estimated 100,000 averted instances of maternal-infant HIV transmission. Yet, there were still an estimated 330,000 in 2011, so there is much work to be done.

Money is necessary but not sufficient. The programmatic infrastructures of maternal health and HIV/AIDS are not sufficiently strong, and have not effectively blended the strength that they do have to realize comprehensive services that identify women with HIV, retain them in services, and provide effective regimens to interrupt maternal-infant HIV transmission. Applied/implementation research has a role to study and make recommendations for improvements in the programmatic weaknesses. We are embarking on a collaborative project between PEPFAR and the US National Institutes of Health, starting with a series of work-shops designed to engage researchers and program implementers to drive research into closer proximity to program barriers, and thereby be constructed in ways that are most relevant, so-called Implementation Science.

However, taking a broader look at how to succeed in this effort, it is instructive to examine the health system requirements of effective PMTCT in the United States (and in many northern countries). In the US;

- 99% of women have used birth control and 73% are current users (compared with less than 20% in sub-Saharan Africa)
- 98% have pre-natal care, and 71% start in first trimester (compared with less than 30% in first trimester in SSA)
- 94% get an HIV test, 85% of get ARVs, and 96% of infants get ARVs (compared with 50% percent in most SSA countries).

This combination of health system strengths and HIV-specific interventions has reduced maternal-infant transmission to single digits in most US States (e.g. 9 infections in New York State during 2010 and 2011).

There are success stories coming from southern countries;

- South Africa has studied a cohort of 10,000 women who have transmission rate of 2% using a correctly applied combination regimen for the pregnancy and post-natal period.
- Malawi has introduced comprehensive combination antiretroviral therapy, and reports 87% of HIV-infected pregnant women taking drug.

Even as these much-needed successes are being realized and reported, the question is whether aggressive HIV testing and treatment of pregnant women alone will reach the elimination goal. Modeling suggests it will not:

- Current coverage of PMTCT of 53% will lead to increase to approx 370,000 annual infant infections
- Increased coverage to 90% will lead to decrease to approx 140,000 infections
- Increased coverage to 90% plus HIV prevention reducing HIV among women by 50% plus meeting family planning needs will lead to decrease to approx 95,000 infections
- All of this plus limiting breast-feeding to the period of ARV administration (often 12 months) will lead to decrease to approx 72,000 infections

In conclusion, we need concentrated and successful HIV interventions, paired with effective health systems infrastructure to deliver the most effective package of services to women. This includes:

- Family planning
- Early pre-natal care
- HIV testing with provision of results
- Antiretroviral therapy; provision of effective and safe regimens
- Retention in care and adherence to therapy
- Management of breast-feeding

Thus, we need the aggressive interventions of successful HIV programs, and also need the robust strength and breadth of a robust health system to truly address HIV in women and children, and thereby drastically decrease HIV infections among children.

Jonathan Mann – “AIDS exposes inequity in the health system, and across societies, and flourishes wherever social inequities are marked.”